Greater Bristol Bus Network
Major Scheme Business Case

Appendix 4I

Risk Assessment Report

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4I.1. Introduction

4I.1.1 As part of the original GBBN programme entry bid a Quantified Risk Assessment (QRA) was undertaken, with the initial workshop conducted in the summer of 2005. The outcome of the workshop was a risks register that outlined: all potential risks; their impact on the GBBN; the probability of the risk occurring; and the mitigation measures proposed.

4I.1.2 Throughout the GBBN bid submission the risk register has been regularly reviewed, with updates and amendments made, where appropriate, to each of the risks. An additional column was added to the register outlining the current status of each risk.

4I.1.3 A second QRA workshop conducted in February 2007, which revisited the risk register that had been last updated in December 2006. The risk register has been updated to include proximity risks that may occur due to the GBBN being undertaken. The second QRA workshop also took into account the mitigation measures that have been put in place (or are to be put in place) that will reduce or remove the significance of the impact on the GBBN.

4I.1.4 Finally the QRA workshop added several new risks that have arisen since the initial workshop and outlined their probability, impact and any possible mitigation measures required before final submission of the scheme to the DfT.

4I.1.5 The remainder of this appendix outlines the process undertaken at the February 2007 workshop to create the Risk register that is found in Annex A.

4I.2. The Workshop 7th February 2007

WORKSHOP OBJECTIVES

4I.2.1 The objectives of the Risk Management workshop were to:

- Review the Risk Register v10 updated on the 4th December 2006;
- Identify any new risks that have arisen since then;
- Review the probability of occurrence and impact on the scheme, for each risk;
- Re-define the Best Case, Most Likely Case and Worst Case cost impact of each risk;
- Run the @Risk Model based on the information generated; and
- Calculate the estimated risk exposure for the Major Scheme Business Case (MSBC).

4I.2.2 The workshop was attended by representatives of the Councils and Atkins, who provided the facilitator for the workshop.

4I.3. Risk Management

REVIEW OF PREVIOUSLY IDENTIFIED RISKS (UPDATING THE RISK ANALYSIS MODEL)

4I.3.1 The workshop participants were invited to review v10 of the Risk Register and to re-assign the impact and probability of occurrence. This was done in accordance with Table 4I.1 and 4I.2.

Table 4I.1 - Criteria for Probability of Occurrence

	Likelihood
Very High	>90%
High	70%
Medium	50%
Low	20%
Very Low	10%

Table 4I.2: Monetary Impact of Risk Arising

	Cost
Very High	>£2.5m
High	£1m
Medium	£500k
Low	£250k
Very low	£100k

4I.3.2 During this exercise a further seven risks (nos. 57 to 63) were identified and these are included in Annex A. It was also agreed that Risks 03, 15, 40, 26, 28 and 29 were Maintenance risks that would have an impact on the Councils running of the schemes rather than being a construction risk to the project. Risks 51, 06, 07, 13 and 14 were identified as risks to the successful operation of the project rather than to construction. As a result the cost impact of the above risks was reduced to zero, as they will not impact the construction phase of the GBBN implemenation.

4I.4. Risk Modelling

ASSESSMENT OF COST IMPACT RANGE

4I.4.1 For each identified risk, and using the 'Most Likely' cost impact the participants calculated the Best Case and Worst Case cost impact scenarios should the risk occur. These values, along with a 'most likely' outcome should the risk occur, are included in Annex A.

@RISK CALCULATION

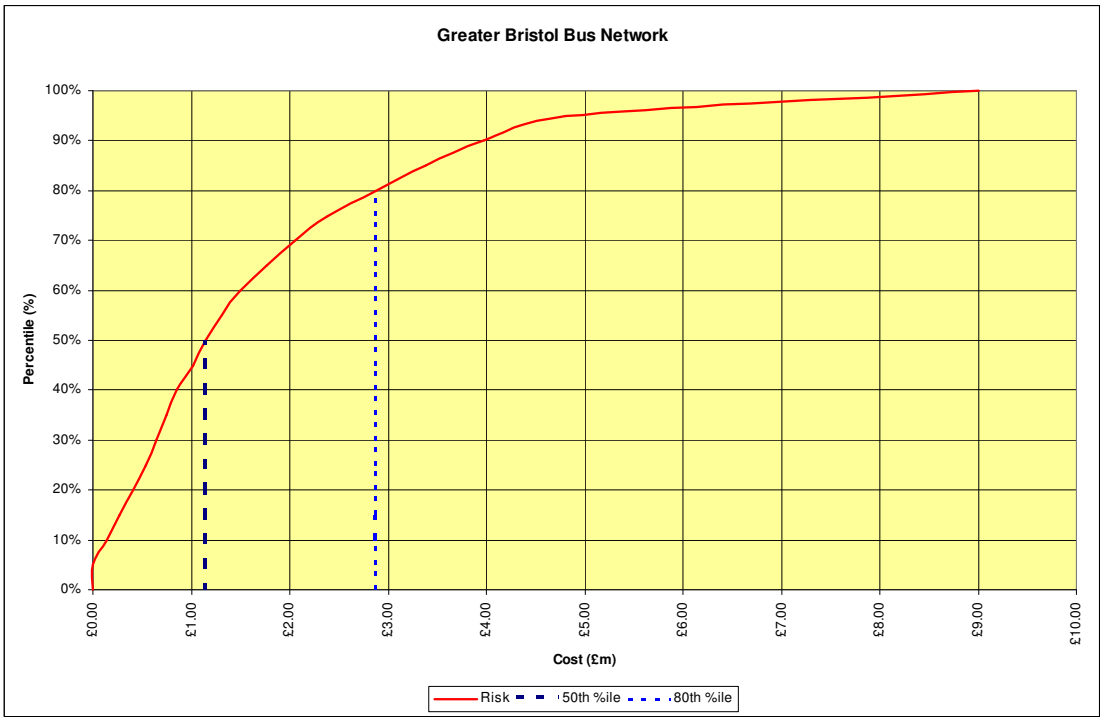
4I.4.2 The Facilitator of the workshop ran the @Risk model, looking at construction risks, based on the inputs from the assessment of the triangular cost impacts. @Risk is a risk analysis and simulation add-in for Microsoft Excel. It is the world's most widely used risk analysis tool. Users replace values in their spreadsheet with @RISK distributions to represent uncertainty, and then simulate the model using powerful Monte Carlo simulation methods. @RISK recalculates the spreadsheet a thousand times. Results are displayed graphically and through detailed statistical reports. Sensitivity and scenario analysis identify critical factors which drive risk. Correlation of inputs, distribution fitting and distribution viewing are also included.

4I.4.3 The output of the analysis details a construction risk value for given confidence limits. This is shown in Figure 4I.1 For the GBBN, the following risk exposure(s) was arrived at:

- 50% Confidence Level - £1.146m; and
- 80% Confidence Level - £2.872m.

4I.4.4 These risk values have been applied to the total scheme costs for the GBBN.

Figure 4I.1 GBBN Risk Exposure, @RISK Model



4I.5. Summary

4I.5.1 The @RISK model output arrived at the risk exposure of £2.872m at the 80% Confidence Risk exposure from the 2007 workshop. This has reduced from the £3.48m figure that was submitted in the 2005 Programme Entry MSBC. This provides evidence that the original risks identified in 2005 are being reduced, removed or mitigated through the existing planning process.

4I.5.2 Whilst every effort has been made to reduce and remove the risks associated with the delivery of the GBBN Full Approval MSBC, it is inevitable that risks are almost certain to occur. The risk management processes set in place as part of the MSBC will enable any risk to be identified and managed as part of the daily processes of the project managers and the IPD.

Annex A: Risk Register